

AN ANALYTIC APPROACH IN IDENTIFYING A LATENT STRUCTURE TO DETERMINE SCORING
CRITERIA FOR A CLINICAL DIAGNOSIS OF TRAUMATIC GRIEF

by

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ABSTRACT

Although reliably recognized as a psychiatric syndrome, traumatic grief has not been identified as a primary axis I diagnosis in the Diagnostic and Statistical Manual of Mental Disorders –fourth edition (DSM-IV). Due to the newness of recognition of this diagnosis, a universally accepted set of diagnostic criteria does not exist. The objective of this thesis was to evaluate the psychometric properties of a newly developed twenty-nine item structured clinical interview for the diagnosis of traumatic grief (SCI-TG) by: assessing its internal consistency; evaluating its inter-rater reliability; describing its factor structure; and determining its construct validity.

The SCI-TG was administered to 166 patients enrolled in an ongoing traumatic grief therapy randomized clinical trial (TGTRCT) MH060783. The SCI-TG showed good internal consistency as assessed by the Cronbach's coefficient alpha (0.74), and good inter-rater reliability (0.81). Exploratory principal components factor analysis yielded the selection of three factors corresponding to symptoms of: "guilt", "failure to adapt", and "separation distress", respectively. Demonstrating convergent validity, the total score of the SCI-TG was significantly correlated with the Inventory of Complicated Grief (ICG), the Hamilton Depression Rating Scale (HDRS), the Structured Interview Guidelines for the Hamilton Rating Scale for Anxiety (SIGH-

A), the Impact of Events Scale (IES), and the Adult Separation Anxiety Disorder (ASAD). The estimated factor scores on factor 1, “guilt”, were not significantly correlated with any of these instruments, and the estimated factor scores on the “separation distress” factor was not significantly correlated with the ASAD, signifying the uniqueness of traumatic grief symptoms. The results of the factor analyses could be used to create subscales of the new 17-item SCI-TG. The distribution of the SCI-TG scores based on the reduced scale resulting from the factor analyses was proposed to be used in determining the scoring of this instrument. Studies of the treatment of bereavement with antidepressants have proven ineffective in treating grief symptoms. The public health relevance of this thesis is in defining these symptoms and developing an instrument to adequately identify such symptoms.

TABLE OF CONTENTS

PREFACE	viii
1. Introduction	1
2. The Development of Selection Criteria for Traumatic Grief	4
2.1. The Inventory of Complicated Grief (ICG)	4
2.2. Selection of Items Included in the Structured Clinical Interview for Traumatic Grief (SCI-TG)	6
3. Methods	8
3.1. Subjects	8
3.2. Analyses	11
3.2.1. Internal Consistency and Interrater Reliability	11
3.2.2. Factor Analysis	12
3.2.3. Construct Validity	12
4. Results	14
4.1.1. Internal Consistency and Interrater Reliability	14
4.1.2. Factor Analysis	15
4.1.3. Construct Validity	20
5. Discussions and Conclusions	24
APPENDIX A: The Inventory of Complicated Grief (ICG)	26
APPENDIX B: The Structured Clinical Interview for Traumatic Grief (SCI-TG)	31
BIBLIOGRAPHY	37

LIST OF TABLES

Table 1: Baseline Demographic and Social Economic Characteristics of the TGTRCT	
Participants.....	10
Table 2: Orthogonal Rotation Factor Pattern of the 17-item SCI-TG	17
Table 3: Inter factor correlations.....	18
Table 4: Oblique Rotation Factor Pattern of the SCI-TG	19
Table 5:Correlations of instruments and factor scores	22

LIST OF FIGURES

Figure 1: Scree plot of 20-item SCI-TG	15
Figure 2:Scree Plot of the 17-item SCI-TG	16

PREFACE

I would like to express my profound thanks and appreciation to the members of my thesis committee. The guidance of Dr. Sati Mazumdar, Dr. Howard Rockette, Dr. Katherine Shear, Dr. Sheryl Kelsey, and Patricia Houck (invited member), was crucial in the development and structure of my thesis. Dr. Sati Mazumdar, my thesis advisor, deserves my special thanks and acknowledgements for it was because of her unwavering care and support that my thesis project came to fruition. Dr. Mazumdar served as my primary guide from the dawning of my project; encouraging me to write, strive for excellence in my analyses, and to remain steadfast in my goals. I would also like to thank Dr. Howard Rockette for embracing the position of my academic advisor, and for taking the initiative to assist me in identifying a project for my thesis. Dr. Rockette in addition to providing sound academic advice, he also gave invaluable advice in assisting me to determine my career path. To Dr. Katherine Shear, I express my sincere thanks for providing me with the challenge of the project upon which my thesis was based. The data analyzed was from Dr. Shear's Traumatic Grief Treatment Randomized Clinical Trial (TGTRCT). Her input as a psychiatric researcher was invaluable. I would also like to thank Patricia Houck for her guidance and input in the statistical analyses selected for my thesis. It was through her that I was first introduced to the techniques of psychometrics. I appreciate the help of Dr. Sheryl Kelsey in assisting me in meeting the requirements of my thesis.

I would like to recognize the help of Russell Silowash, the data manager for the TGTRCT in assisting me with understanding the data. Thanks also to Joanne Pegher for her patience and assistance through the process of submitting of my thesis. Lastly, but most importantly, I would be remiss if I did not mention the care, and support of my loving family.

1. Introduction

Numerous studies have documented the spectrum of individuals' responses to bereavement (Cutcliffe, 1998; Gilbar, Ben-Zur, 2002; Middleton, Burnett, Raphael, & Martinek, 1996). The many stages of the grieving process often result in symptoms that are shared by a variety of psychiatric disorders such as depression, posttraumatic stress disorder, along with known anxiety disorders. Research in grief related responses have led to the identification of the psychiatric condition known as traumatic grief, initially referred to as "complicated grief".

Traumatic grief is a recently described condition, separate from existing diagnoses found in the Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition (DSM-IV), including: major depressive disorder, or posttraumatic stress disorder (PTSD). Traumatic grief has been shown to comprise certain symptoms distinct from those related to bereavement-related emotional disorders found in DSM IV (Prigerson et al., 1995a). Although depression is recognized as being a familiar response to bereavement, investigators studying this process have shown that while symptoms of the disorder tend to decrease upon antidepressant treatment, symptoms of grief remained high (Pasternak et al., 1991).

Although distinct from other psychiatric disorders, traumatic grief does share some symptoms in common with mood and anxiety disorders found in the DSM-IV. The syndrome of traumatic grief has been reported to include symptoms that include: disbelief, avoidance, numbness, hopelessness, among others- symptoms that resemble those found in known disorders such as PTSD (Prigerson et al. 1999b). However, a study done by Pasternak et al (1991) in which

antidepressant therapy was given to a spousal-bereaved population, found that while the antidepressant seemed to effectively reduce the symptoms of depression, the grief symptoms appeared to remain unchanged. Their findings suggest that there is a component of bereavement, grief, which is separate from depression that had not been previously recognized as a separate entity. A previous pilot study by Jacobs, Nelson, and Zisook, (1987), had also found that the treatment of bereavement through the use of antidepressants was not effective in treating the grief component. Symptoms of traumatic grief that appear to be distinct from those of depression include preoccupation with thoughts of the deceased, separation distress, intense yearning, longing, disbelief, a lack of acceptance of the death, being stunned by the death, and pangs of grief or severe emotion (Prigerson et al., 1999b, Prigerson et al., 1999a; Horowitz et al., 1997).

In the early nineties, a consensus panel of experts in the field of bereavement met to propose diagnostic criteria for the condition of traumatic grief (Prigerson et al., 1999b). Their deliberations included the identification of the distinct components of traumatic grief-symptoms of traumatic distress, and symptoms of separation distress, the latter not being present in PTSD or mood disorders (Prigerson et al., 1999b). The revision of previously selected set of criteria for complicated grief, the Inventory of Complicated Grief (ICG), a self-report scale, was also a result of these deliberations.

Work supporting the inclusion of traumatic grief in the Diagnostic and Statistical Manual of Mental Disorders –Fifth Edition (DSM-V), has become an earnest campaign among psychiatric researchers. It is in this context that researchers have sought to develop methods to reliably assess the symptoms of this syndrome. The structured clinical interview for traumatic grief (SCI-TG) was developed in the pursuit of further defining the symptoms of traumatic grief.

This thesis intends to evaluate the psychometric properties of the newly developed twenty-nine item structured clinical interview for the diagnosis of traumatic grief (SCI-TG) by: assessing its internal consistency; evaluating its inter-rater reliability; describing its factor structure; and determining its construct validity. The instrument was administered to participants in an ongoing study of the treatment for traumatic grief. The internal consistency of the SCI-TG was assessed with Cronbach's alpha coefficient. Inter-rater reliability was evaluated by calculating the intraclass correlation coefficient. Exploratory principal components factor analysis was used to determine a most parsimonious and scientifically meaningful list of criteria extracted from the instrument. Evidence of the construct validity of the SCI-TG was investigated by examining the correlations of the SCI-TG with other established instruments measuring traumatic grief, namely, the Inventory of Complicated Grief (ICG), as well as instruments measuring symptoms of depression and anxiety in order to assess its convergent and divergent validity. Finally, an appropriate scoring algorithm for the SCI-TG is proposed in order to quantify the symptoms associated with traumatic grief.

2. The Development of Selection Criteria for Traumatic Grief

2.1. The Inventory of Complicated Grief (ICG)

The ICG was the first simple assessment tool to reliably identify symptoms of traumatic grief (Prigerson et al., 1995a). The initial selection of items was accomplished by a literature review of symptoms associated with maladjustment to grief, and long-term dysfunction, in combination with a factor analysis of instruments collected in a study of geriatric bereavement related depression. These symptoms were shown to be distinct from symptoms of anxiety and depression (Prigerson et al., 1995a, 1995b).

In that study, the ICG was administered to a total of $n=97$ widowed elders recruited as a substudy from an original study of sleep physiological changes in bereavement (Prigerson et al., 1995b). Items in the original ICG included 22 items representing grief symptoms such as: preoccupation with thoughts of the deceased, crying, searching and yearning for the deceased, disbelief about the death, being stunned by the death, not accepting the death, difficulty in doing things that one normally would do, anger over the death, distrust and detachment from others as a consequence of death, pain in the same parts of the body as experienced by the deceased before the death, avoidance of reminders of the deceased, feeling that life is empty without the deceased, survivor guilt, loneliness, bitterness about the death, and envy of others who have not lost others. The results of the factor analysis in that study determined that items on the ICG were best characterized as one factor (Prigerson et al., 1995b). The scale had a Cronbach's alpha coefficient of 0.94, and the test retest reliability over 6 months was 0.80. Findings indicated that

a total ICG score of above 25 indicated “complicated grievers”, which were found to be significantly different from uncomplicated grievers on the Medical Outcomes Short-form. A total of nineteen items were selected for the final ICG scale shown in the appendix Form 1. In another study by Prigerson et al., (1995a), a preliminary validation of the ICG was carried out using a sample of n=82 bereaved spouses. In that study, the factor analysis performed found items loading on two factors, one with correlated symptoms of those similar to bereavement-related depression, and the other, comprising a syndrome of complicated grief, furthering the argument that traumatic or complicated grief, is distinct from bereavement related depression (Prigerson et al., 1995a).

The revision of the scale, published in 1999, came as a result of the convening of a consensus panel of experts in bereavement, as mentioned earlier. Following a review of the available evidence documenting the symptoms of traumatic grief, the two basic symptoms that defined traumatic grief, separation distress (criterion A), and traumatic distress (criterion B), were identified. The ICG was revised to reflect those symptoms, and a preliminary test of the instrument was conducted on data from the Zisook and Stephen Shacter’s San Diego widowhood study (Prigerson et al., 1999b). Upon the rerunning of the factor analyses, as well as performing ROC analyses, the entire set of items showed good internal consistency. The internal consistency further improved with the deletion of two items, namely: ‘difficulty imagining a fulfilling life without the deceased’, and the PTSD symptom-avoidance, which both had low specificity, and low item-total correlation (Prigerson et al., 1999b). The ensuing ICG shown in the appendix, Form II, was grouped into categories (Criteria A-D), with Criterion A representing separation distress, Criterion B representing traumatic distress, and Criteria C and D representing timing of

death and functional impairment (Prigerson et al., 1999b). The original nineteen-item ICG, published in 1995 (Prigerson et al, 1995b) was used in these analyses.

2.2. Selection of Items Included in the Structured Clinical Interview for Traumatic Grief (SCI-TG)

The twenty-nine-item interview was developed through the work of the traumatic grief treatment research team at the University of Pittsburgh Medical Center, Western Psychiatric Institute and Clinic, led by a psychiatric researcher, who was also a member of the original consensus panel on traumatic grief. The development of this scale was for the purpose of providing an interview-based assessment of the symptoms of traumatic grief. The choice of items on the SCI-TG was based upon a review of available literature on traumatic grief, and clinical observations.

Based on deliberations of the scale development team, the SCI-TG shown in the appendix: Form III was revised several times, so that the final version consisted of twenty-nine items grouped into seven parts. Two items in Part I addressed characteristics of the death and included the relationship to the deceased, and feelings of numbness or disbelief. Part II included items measuring current grief intensity namely, trouble accepting the death, intense yearning, longing, and searching, anger or bitterness, the frequency of intense pangs of grief, thoughts of betrayal upon stopping the process of grief, others avoiding mentioning the deceased, and feelings of grief being the only thing left of the deceased. Part III included cognitive symptoms, with items addressing recurrent intrusive thoughts or images, visualization, guilt, and thoughts of somehow preventing the death from occurring. Part IV included inadequacy/ depressive symptoms such as, hopelessness, thoughts of not being able to experience joy, alienation, and

difficulty in dealing with everyday problems. Part V included symptoms of preoccupation such as being in a state of reverie about the deceased, finding comfort in things that allowed reminiscing of the deceased, and spending time with items belonging to the deceased. Part VI included symptoms of avoidance: the avoidance of certain people, or places that remind of the deceased, reluctance in talking about the death, and avoiding getting rid of possessions of the deceased, as they may bring comfort. Finally, Part VII was a single item inquiring whether grief was the most important problem at the present time. The responses to the items of the SCI-TG are ordered in a Likert type scale: *0= No, 1= Maybe, 2=Yes.*

3. Methods

3.1. Subjects

The traumatic grief therapy randomized clinical trial (TGTRCT) MH060783 is an ongoing clinical trial to examine the effects of 16 sessions of treatment with traumatic grief therapy, compared to 16 sessions of interpersonal psychotherapy (the control condition). About 430 subjects were screened for inclusion into the trial. Of the 430 subjects, 342 met initial eligibility criteria, of which 219 consented to the study. The SCI-TG was administered to 166 of these help-seeking individuals.

Inclusion into the study required subjects to be at least 18 years of age, ICG scores of at least 30, bereavement for at least six weeks, willingness to undergo random assignment to either an exposure-based treatment (traumatic grief therapy), or interpersonal psychotherapy, and not on medications or change in medication dosage for at least six months. Exclusion criteria included current active suicidal ideation, current mania, current or past history of schizophrenia or dementia, current substance abuse or dependence, psychoses, or ongoing domestic violence. Study participants are assessed at three major assessment time points. The first major assessment time point is at pretreatment (MA1), where independent evaluators who met certification criteria and had a minimum of a master's level education administer diagnostic interviews and symptom rating scales, namely, the Structured Clinical Interview for DSM-IV Axis I Disorders-Patient Edition (SCID-I/P; First, Spitzer, Gibbon, Williams, 1995), the SCI-TG, the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960), to which an 8-item supplement was included, and the Structured Interview Guidelines for the Hamilton Rating Scale for Anxiety (SIGH-A; Shear, M.K, et al., 2001). The participants are followed for approximately 16-20 weeks (mini-

sessions), during which self-report measures, including the ICG, the Adult Separation Anxiety Disorder (ASAD; Manicavasagar, Silove, Curtis, 1997), the Impact of Events Scale (IES; Horowitz, Wilner, Alvarez, 1979), the Interpersonal Support Evaluation list (ISEL; Cohen, Hoberman, 1983), the Beck Anxiety Inventory (BAI; Beck, 1988), and Beck Depression Inventory (BDI; Beck, 1961), are used before each therapy session. At the end of that time period, the second major assessment (MA2) is given by the certified independent evaluator. The final major assessment (MA3) occurs at approximately 40 weeks after the MA1 pretreatment assessment, when the certified independent evaluators administer post treatment diagnostic interviews and symptom rating scales.

The baseline demographic and social economic characteristics of the participants to whom the SCI-TG was administered are given in Table 1. Among the 166 subjects given the SCI-TG, there were $n=134$ (81%) females and $n=32$ (19%) males. The subjects had a mean age of 47 yrs. ($SD=12$) and ranged from age 19 to 85. The TGTRCT successfully recruited a respectable number of African American participants, $n=51$ (31%), and approximately (67%) $n=109$ were white. Sixty eight percent of the SCI-TG sample had at least some college education. A substantial number, 35% reported that they lived alone. The average period of the primary bereavement (as data on subsequent losses were collected) of the SCI-TG sample was about 5 years. At least 31% of the deaths were defined as “violent”, meaning homicide, suicide, or accidents. To date, the SCI-TG has been administered to $n=66$ participants at the second major assessment (MA2).

Table 1: Baseline Demographic and Social Economic Characteristics of the TGTRCT Participants

<u>Demographic & social economic characteristics</u>			
	N (%)	Mean	S.D.
<hr/>			
Gender:			
Male	32 (19%)		
Female	134 (81%)		
Race:			
White	109 (67%)		
African American	51 (31%)		
Asian	2 (1%)		
American Indian	1 (<1%)		
Other	1 (<1%)		
Age (19-85)		47	12
Marital Status:			
Married	43 (26%)		
Not married	123 (74%)		
Education Level:			
High school or less	52 (32%)		
At least some college	78 (48%)		
At least some graduate school	32 (20%)		
Employment Status:			
Full time	45 (27%)		
Part time	29 (18%)		
Retired	17 (10%)		
Full time homemaker	12 (7%)		
Unemployed	63 (38%)		
Annual Household Income:			
Under \$20,000	55 (35%)		
\$20,000-less than \$40,000	62 (39%)		
\$40,000 and above	41 (26%)		

3.2. Analyses

3.2.1. Internal Consistency and Interrater Reliability

The internal consistency of the SCI-TG was calculated by using Cronbach's alpha coefficient; a measure of how well a set of items measures a single one-dimensional latent construct. It is known to provide the lowest estimate of reliability expected for an instrument (Hatcher, 1994). Co-ratings of the SCI-TG performed by two raters from a pool of raters in the study on a total of 32 patients were used to assess the interrater reliability. Interrater reliability was calculated using Fleiss's (1986) intraclass correlation coefficient (ICC) equation for raters considered to be fixed:

$$\hat{R} = \frac{N(PMS - EMS)}{N(PMS) + (k - 1)RMS + (N - 1)(k - 1)EMS}$$

Where,

N= the number of patients

K=the number of raters

PMS, RMS, EMS = mean squares for patients, raters and error, respectively

3.2.2. Factor Analysis

The factor pattern of the SCI-TG was assessed by the principal components factor analysis, using squared multiple correlations as prior communality estimates. While there are various methods available for factor extraction, the principal axis factor method, the most commonly used method (Tabachnick, Fidell, 1996), was used to extract the factors in these analyses with both an orthogonal (varimax) and oblique (promax) rotations. Rotations are a linear transformation of the factor solution, thereby allowing for an easier interpretation of the factor solution (Hatcher, 1994). Rotation of the coordinate axes also allows for clearer loadings on the extracted factors (Dunteman, 1989). The varimax rotation maximizes the variance of a column of the unrotated factor pattern matrix (in which the rows represent the variables, and the columns represent the retained factors), yielding uncorrelated factors (Hatcher, 1994). The promax rotation method produces estimates of the correlations between factors by allowing factors to have non-zero correlations (Hatcher, 1994). In this study, both rotation methods were used since it was not determined beforehand, whether the factors extracted would be correlated with each other, as is the underlying difference between these two methods.

3.2.3. Construct Validity

Convergent and divergent validity of the SCI-TG was assessed by assessing the Spearman rank correlations between the estimated factor scores obtained from the factor analyses, the total SCI-TG score, and the interviewer administered and self reports instruments given at MA1 (baseline). These instruments were namely, the ICG, the ISEL, the IES, the HDRS, and the ASAD. These specific instruments were chosen for correlation analyses because they together

encapsulate the known symptoms associated with traumatic grief. The ICG, being the proven scale for the diagnosis of traumatic grief (Prigerson et al, 1995b), was used as entry criteria into the TGTRCT study. It was expected that the total SCI-TG score would correlate with the total ICG score, which would indicate similarity between these two instruments in measuring traumatic grief. A significant correlation between the total SCI-TG score and the HDRS, the depression rating scale would show the SCI-TG was measuring depressive symptoms, also known to be associated with the syndrome of traumatic grief.

The IES, the impact of events scale, measures two of the responses to traumatic stressors, intrusion, and avoidance (Horowitz, Wilner, Alvarez, 1979). A significant correlation between The IES and the SCI-TG would also demonstrate that the SCI-TG was adequately measuring these known traumatic grief symptoms. The ASAD, which measures adult separation anxiety, would be expected to correlate with the SCI-TG, since separation distress, has been previously described by Prigerson et al., (1995) as being a component of traumatic grief. The final scale chosen for a comparison, the ISEL is a measure of perceived social support. It is divided into four subscales: appraisal- perceived availability of someone to talk to, tangible-perceived availability of material aid, self-esteem-perceived availability of a positive comparison of one's self to others; and the belonging subscale- the perceived availability of people one can do things with (Cohen, Hoberman, 1983). A significant correlation would show how the patients with traumatic grief viewed their daily living situations. The estimated factor scores were obtained from the SCORE option in SAS PROC FACTOR procedure. These estimated factor scores represent a linear composite of the optimally weighted variables (items) (Hatcher, 1994). Spearman rank correlations were used since linearity could not be assumed for these

observations, and also since ordinal data (the ISEL) was included. All analyses were performed using the Statistical Analysis System (SAS) V.8.

4. Results

4.1.1. Internal Consistency and Interrater Reliability

During the initial process of developing the 29-item SCI-TG by the traumatic grief research group, some new items were added, and others removed. Due to the several revisions of the instrument, five of these items had too few observations to be included in these analyses (approximately 64% of responses were missing for each of Q2A, Q2D, Q5A, Q6B and Q6D). These five items had poor responses primarily because they were included in the most current version of the instrument, and not in the previous versions administered at the beginning of the study. The first 3 questions of the SCI-TG; *Q1A-Have you experienced the death of someone close to you?* *Q1B-If yes did you feel numbness or disbelief?* *Q1C-Was the death more than 6 months ago?* , described characteristics of the death, and at such were not considered as diagnostic criteria for traumatic grief, and therefore not included in these analyses. With these items removed from the scale, the remaining 21 items were used in calculating the Cronbach's alpha. The raw and standardized alpha indicated good internal consistency ($\alpha \approx 0.74$). When the item-total correlations (the correlation between an individual item, and the sum of the remaining items on the scale) (Hatcher, 1994) were examined, there was one item, "*Q6C-Do you feel reluctant to talk about _____?*" that had an item-total correlation of 0.08, while all others ranged from 0.20-0.45. This relatively low item-total correlation indicated that this item may not be measuring the same construct as the other items in the scale (Hatcher, 1994), and a removal of this could produce a higher coefficient alpha. The internal consistency of the scale improved

slightly with the removal of this item ($\alpha \approx 0.75$). Interrater reliability was available for 32 correlated SCI-TG's. The intraclass correlation coefficient indicated good reliability of the SCI-TG ratings with $\hat{R} = 0.81$.

4.1.2. Factor Analysis

Principal components factor analysis was performed on the 20-item scale. The scree plot of the eigenvalues, shown in Fig. 1, indicated one dominant factor, with a relatively large “break” after the third factor. The criterion of selecting the factor located before a relatively large break in the scree plot, proposed by Cattell (1966), along with the Kaiser (1960) criterion of selecting factors with eigenvalues greater than 1, were used to determine the number of factors for retention. After the initial principal factor axis method, 3 factors were retained for the varimax and promax rotations. Factor 1 had an eigenvalue of 2.88 while factors 2 and 3 had eigenvalues of 1.48, and 1.04, respectively.

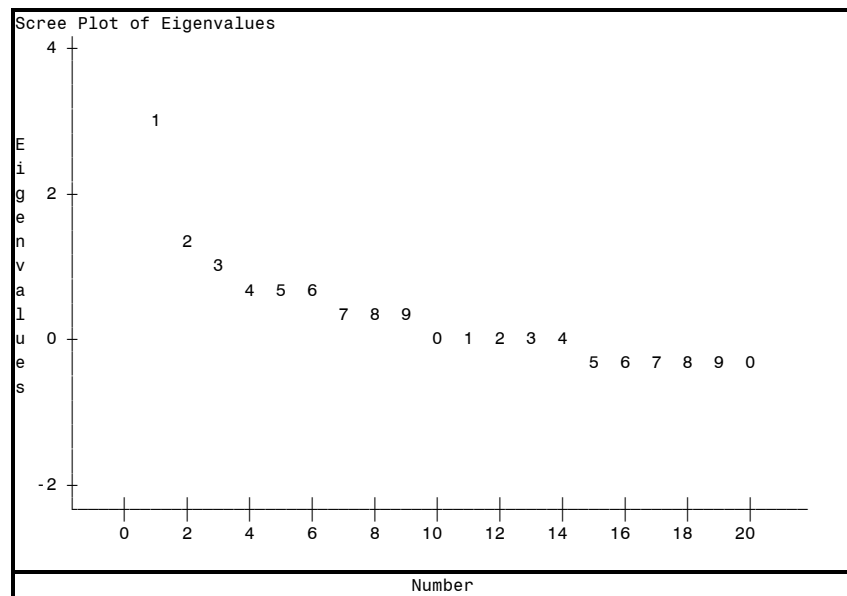


Figure 1: Scree plot of 20-item SCI-TG

Both orthogonal and oblique rotations were performed for a clearer interpretation of the factors. In both rotations, there were three items that either did not indicate a clear loading on the three factors, or did not appear to have significant loadings (<0.3) these factors. These items were: Q6A- *“Do you avoid activities, people, place, or objects that remind you of _____?”*, Q2G- *“Do other people avoid talking about him/her because they are afraid you will get very upset?”*, and Q2C- *“Do you feel bitter or angry about the death?”*. These items were removed from the scale, and the factor analysis was rerun.

The oblique and orthogonal rotation methods were performed on the new 17-item scale. The eigenvalues for the three factors were 2.60, 1.45, and 1.02, respectively. Factor 1 accounted for a proportion of 48% of the total variance, factor 2 accounted for 27%, and factor 3 accounted for 19% of the proportion of variance in the data. Figure 2 illustrates the scree plot of the new 17-item scale. The factor loadings of the orthogonal rotated factor pattern are shown in Table 2.

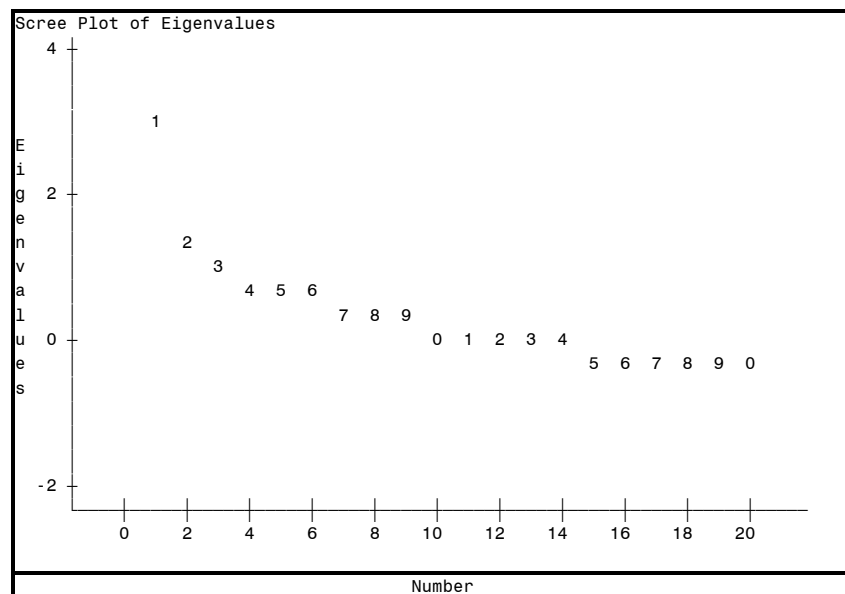


Figure 2: Scree Plot of the 17-item SCI-TG

Table 2: Orthogonal Rotation Factor Pattern of the 17-item SCI-TG

SCI-TG Item No.	Description of item	Factor 1	Factor 2	Factor 3
Q3D	Guilty/self blaming thoughts	0.77		
Q3E	Blaming self for doing/not doing something to help	0.75		
Q3F	Thoughts of prevention of death although not rational	0.66		
Q2E	Grief is all that is left of deceased		0.55	
Q4B	Thoughts of not experiencing joy/ satisfaction without deceased		0.51	
Q2F	Stop grieving would equal a betrayal of deceased		0.50	
Q4E	Difficult to deal with small problems since death		0.48	
Q4D	Feelings of being at the “end of rope”		0.47	
Q4C	Feeling alienation/difficult to care for others		0.39	
Q4A	Life has no purpose		0.39	
Q5C	Spend time with items belonging to deceased			0.59
Q5B	Strong urge to reminisce, or else feel badly			0.51
Q3B	Keep picturing deceased as they were before death			0.42
Q2B	Intense yearning/ longing for deceased			0.41
Q3A	Recurrent intrusive thoughts/ images			0.40
Q7	Grief is the most important problem			0.35
Q3C	See deceased in other bothering way			0.30

Note: Factor 1 =Guilt, Factor 2= Failure to adapt, Factor 3= Separation distress

While the factor loadings were somewhat more defined with the promax rotation, the rotated factor pattern was the same as the orthogonal rotation. There did not appear to be any differences between the two methods. Table 3 shows the inter-factor correlations. The three factors did not appear to be strongly correlated. The highest correlation was between factors 2 and 3, the failure to adapt, and traumatic distress factors, $r=0.30$. While all three factors do not significantly correlate, there is still an underlying relationship between the three factors. Therefore, the varimax (orthogonal) rotation, which does not allow the correlation of the extracted factors, was used for further analyses. The factor loadings from the oblique rotation are shown in Table 4.

Table 3: Inter factor correlations

Factor	1	2	3
1. Guilt		0.15	0.19
2. Failure to adapt			0.30
3. Separation distress			

Table 4: Oblique Rotation Factor Pattern of the SCI-TG

SCI-TG 3 Item No.	Description of item	Factor 1	Factor 2	Factor 3
Q3D	Guilty/self blaming thoughts	0.78		
Q3E	Blaming self for doing/not doing something to help	0.75		
Q3F	Thoughts of prevention of death although not rational	0.66		
Q2E	Grief is all that is left of deceased		0.54	
Q4E	Difficult to deal with small problems since death		0.51	
Q4D	Feelings of being at the “end of rope”		0.50	
Q4B	Thoughts of not experiencing joy/ satisfaction without deceased		0.49	
Q2F	Stop grieving would equal a betrayal of deceased		0.48	
Q4C	Feeling alienation/difficult to care for others		0.39	
Q4A	Life has no purpose		0.36	
Q5C	Spend time with items belonging to deceased			0.63
Q5B	Strong urge to reminisce, or else feel badly			0.54
Q3B	Keep picturing deceased as they were before death			0.42
Q3A	Recurrent intrusive thoughts/ images			0.41
Q2B	Intense yearning/ longing for deceased			0.39
Q7	Grief is the most important problem			0.33
Q3C	See deceased in other bothering way			0.30

Note: Factor 1 =Guilt, Factor 2= Failure to adapt, Factor 3= Separation distress

Like the oblique rotation, the orthogonal rotated factor patterns showed distinct factor loadings on the three factors. Items loading on Factor 1 were: blaming self, guilty thoughts, and thoughts of being preventing the death. Factor 2 items were: feeling that grief is all that was left of the deceased, not experiencing any joy or satisfaction without the deceased, ending grief would be a betrayal of the deceased, feeling alienation/difficult to care for others, feelings of being at “the end of the rope”, feeling as if life has no purpose, feelings of hopelessness, alienation, and difficulty in dealing with everyday life situations. The items loading on Factor 3 were: spending time with items belonging to the deceased, reminiscing, recurrent intrusive thought or images, visualizing the deceased in an upsetting way, intense yearning and longing for the deceased, and feeling that grief is currently their most important problem.

The items loading on factor 1 appear to measure symptoms of guilt. The items loading on factor 2 appear to constitute symptoms of a failure to adapt to the loss. Symptoms such as thoughts of not experiencing any joy or satisfaction without the deceased, feeling like grief is all that is left of the deceased, life having no purpose, feelings of being at the “end of the rope” have been previously identified as being symptoms of failure to adapt (Horowitz, 1997). The third factor appeared to constitute symptoms of separation distress. Symptoms such as: reminiscing, intense yearning or longing for the deceased, recurrent intrusive thoughts of the deceased have been identified as separation distress, a key component of traumatic grief (Prigerson et al, 1999b). The three factors indicated good internal consistency with the three factors having Cronbach’s coefficient alpha of 0.81, 0.67, and 0.61, respectively.

4.1.3. Construct Validity

The estimated factor scores, and the total score of the SCI-TG were correlated other assessment instruments, specifically, scores from the ICG, ASAD, HDRS, SIGH-A, and IES

instruments to determine the convergent, and divergent validity of the SCI-TG. The total SCI-TG score was significantly correlated with the ICG score with $r = 0.55$ (p-value: <0.001). The total SCI-TG score was also significantly correlated with the other instruments, the HDRS $r = 0.49$ (p-value: <0.001), the SIGH-A, $r = 0.35$ (p-value <0.0001), the total ISEL score $r = -0.28$ (p-value $=0.001$), and the total IES score $r = 0.31$ (p-value <0.001).

The estimated factor scores on factor 1, the guilt symptoms, were only significantly correlated with the *Intrusive thoughts* component of the IES $r = 0.18$ (p-value= 0.04), and the total IES score $r = 0.18$ (p-value <0.04). The estimated factor scores on factor 2, the failure to adapt items, were significantly correlated with the ICG $r = 0.52$ (p-value <0.0001), the HDRS, $r = 0.44$ (p-value <0.0001), all of the subscales of the ISEL, namely, the *Appraisal* subscales $r = -0.31$ (p-value <0.001), the *Tangible* subscale, $r = -0.22$ (p-value $=0.009$), the *Self esteem* subscale, $r = -0.42$ (p-value <0.0001), and the *Belonging* subscale $r = -0.28$ (p-value <0.0011). The estimated factor 2 scores were significantly correlated with the total ISEL score $r = -0.36$ (p-value <0.0001). Estimated factor scores on factor 2 were significantly correlated with the IES, and with one of its subscales, *Intrusive thought*, but not with the *Avoidance* subscale, $r = 0.25, 0.28$, and 0.16 , respectively, with corresponding p-values= 0.003, 0.0008, and 0.05. Factor 2 was also significantly correlated with the SIGHA $r = 0.28$ (p-value $=0.0011$), and only slightly correlated with the ASAD $r = 0.18$ (p-value $=0.04$). The estimated factor scores on factor 3, the separation distress factor, were significantly correlated with the ICG score, $r = 0.29$ (p-value $=0.0006$), the HDRS, $r = 0.29$ (p-value $=0.0007$), SIGH-A, $r = 0.20$ (p-value $=0.018$), and the Intrusive thought subscale of the IES, $r = 0.29$ (p-value $=0.0004$). These results are presented in Table 5.

Table 5:Correlations of instruments and factor scores

Instrument	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Total SCI-TG Score	0.55*	0.21*	0.49*	0.35*	-0.24*	-0.13	-0.40*	0.25*	0.28*	0.41*	0.14	0.31*	0.38*	0.68*	0.68*	
2. Total ICG Score		0.43*	0.55*	0.42*	-0.26*	-0.18	-0.43*	-0.32*	-0.32*	0.42*	0.40	0.47*	0.13	0.52*	0.29*	
3. ASAD			0.34*	0.38*	-0.15	-0.22**	-0.44	-0.24*	-0.28*	0.36*	0.31*	0.39*	0.09	0.18	0.07	
4. HDRS				0.75*	-0.35*	-0.35*	-0.53*	-0.47*	-0.48*	0.41*	0.34*	0.43*	0.05	0.44*	0.28*	
5. SIGH A					-0.35*	-0.26*	-0.44*	-0.36*	0.41*	0.36*	0.25*	0.35*	0.05	0.28*	0.20**	
6. ISEL-appraisal						0.62*	0.58*	0.74*	0.86*	-0.18**	-0.20**	-0.22**	0.03	-0.31*	-0.11	
7. ISEL- tangible							0.51*	0.72*	0.84*	-0.06	-0.11	-0.11	-0.11	-0.22**	-0.01	
8. ISEL- self-esteem								0.66*	0.77*	-0.29*	-0.27*	-0.33*	-0.03	-0.42*	-0.22**	
9. ISEL- belonging									0.92*	-0.23*	-0.17*	-0.25*	0.04	-0.28*	-0.14	
10. ISEL total score										-0.21**	-0.21**	-0.25*	0.06	-0.36*	-0.11	
11. IES-intrusive thought											0.51*	0.84*	0.17	0.28*	0.29*	
12. IES-avoidance												0.88*	0.09	0.17	-0.01	
13. IES total score													0.18**	0.25*	0.15	
14. Factor 1-Guilt															-0.02	0.00
15. Factor 2-Failure to adapt																0.18**
16. Factor 3-Separation distress																—

* p-value <0.01

** p-value<0.05

The SCI-TG demonstrated convergent validity, by showing significant correlation of the total SCI-TG score with all of the instruments used in these analyses. The highest significant correlation was with the ICG; the only known established scale for the measuring traumatic grief, therefore indicating that this instrument is indeed measuring the symptoms of this disorder. Significant correlations with the rest of the instruments also strengthen the finding that this instrument captures the multi-syndrome nature of traumatic grief. Convergent validity is also shown in the correlations of the estimated factor scores of the three factors. Estimated factor scores on factor 2, had the highest correlation of the factor score with the ICG. This factor essentially encapsulates the majority of the symptoms found in the Criterion B section of the ICG (Prigerson, 1999). Feelings of being at the end of one's rope, life having no purpose, feeling alienated, difficulty in dealing with every day problems since the death constitute the symptoms in this criterion, and those of the high estimated factor scores for responses on this factor

Divergent validity was demonstrated through the correlations of the estimated factor scores on the three factors. The estimated factor scores on factor 1 were not significantly correlated with any of the instruments used in these analyses. This factor, guilt was not significantly correlated with the HDRS, the depression rating scale, indicating that the guilt associated with traumatic grief may be separate from that generally found in bereavement related depression. It is worth noting that the factor scores on this factor were not significantly correlated with the ICG, as this scale does not have a guilt component. Divergent validity is also shown by the non-significant correlation of the factor scores on factor 3 with the ASAD. This could also demonstrate the uniqueness of the separation distress factor traumatic grief as compared to the known definition of the symptoms of adult separation anxiety. It is also worth noting that the estimated factor scores on this factor (3) were not significantly correlated with the total IES score, or with the *Avoidance* subscale of this instrument, but was highly correlated with the *Intrusive thought* subscale $r = 0.30$ ($p\text{-value}=0.004$). None of the estimated factor scores or the total SCI-TG score were significantly correlated with the *Avoidance* subscale of the IES. While there are differing views on whether avoidance, a primary symptom of PTSD, is a primary symptom of traumatic grief (Prigerson et al. (1999b), it should be noted that the majority of the items relating to symptoms of avoidance were not included in the total SCI-TG score or the factor analyses. The avoidance items on the SCI-TG were primarily found in Part VI of the instrument. Due to the initial revisions of the instrument by the research group, Q6B-“*Do you avoid going to the cemetery or places you went together.....?*”, and Q6D-“*Do you avoid getting rid of possessions.....?*” had too few observations, and could not be included in the analyses. Q6C-“*Do you feel reluctant to talk about _____?*” was also eliminated after the calculation of the Cronbach’s coefficient alpha due to its low item-total correlation. Q6A- “*Do you avoid*

activities, people, place, or objects that remind you of _____?” was eliminated from the instrument due to its poor factor loading. This resulted in all four of the *Avoidance* section items being eliminated before the construct validity of the instrument was assessed, leading to these seemingly non-significant correlations.

5. Discussions and Conclusions

The purpose of this paper was to assess the psychometric properties of a newly developed structured clinical interview of traumatic grief (SCI-TG) and to determine whether the construct of this instrument effectively measure the known symptoms of traumatic grief. The results of the factor analysis show that the instrument indeed measures such symptoms. The 3 factors, guilt, separation distress, and failure to adapt, are all symptoms previously highlighted as indicators of traumatic grief. The three factors identified, form a grouping of a host of symptoms associated with traumatic grief. This could result in the definition of new subscales of the instruments. Instead of having seven distinct parts, the results of the factor analysis suggest that the SCI-TG could be now be divided into three parts or subscales, each accounting for the three factors.

The summary total score of the SCI-TG had a mean value of 23. The median value, which perhaps would be more meaningful for interpretation, since values ranged from 8 - 34, was 24. Values in the upper quartile of scores ranged from 28 to 34, and the lower quartile ranges from 8 to 18. It is suggested from these analyses that the values in the lower quartile represent a mild diagnoses of traumatic grief, while the median range suggests a moderate display of symptoms, and the higher quartile representing severe or a highly increased display of the traumatic grief symptoms. This suggestion originates from the fact that the individuals in the study were already diagnosed with having traumatic grief by the criterion of entry into the study, particularly, an

ICG score greater than or equal to 30. Scoring of the instrument is proposed in using the median score of the SCI-TG as a cut-off value in measuring quality of life indicators for persons score above or below this figure. Similar method was used in selecting the scoring criteria for the ICG (Prigerson, H. 1995b). Again, noting that patients in this study are already known to have traumatic grief (an ICG score of at least 30), it is proposed that the cutoff value be used as an indicator of the severity of their traumatic grief symptoms.

Potential limitations of these analyses include the absence of data for test-retest reliability. Such data could further show the reliability of the items of the SCI-TG over time, and illustrate the sensitivity, and specificity of the instrument. Also, these analyses are known to be data specific. It is perceivable that estimated factor scores on the factor loadings could yield slightly different results, with the same analyses were carried out on a different population of grievers. Further testing of this instrument on different populations of grievers and with a control group of non bereaved, could lead to further validation of this scale.

Unlike other studies on which the ICG was tested, which were primarily late life studies, the SCI-TG presented an analysis of traumatic grief in a population with the mean age of 46, and had significantly younger population. Further investigation of this population could reveal some other unique characteristics of traumatic grief, not previously identified in previous studies.

APPENDIX A: The Inventory of Complicated Grief (ICG)

Form 1. The ICG

INVENTORY OF COMPLICATED GRIEF

ID: _____	Date: ____/____/____
	Time: ____:____ am pm

Please circle the relation of the deceased and fill in their first name.

- | | | |
|--|---------------------------------|-------------|
| 1. Spouse: | Husband Wife | Name: _____ |
| 2. Parent: | Father Mother | Name: _____ |
| 3. Child: | Son Daughter | Name: _____ |
| 4. Sibling: | Brother Sister | Name: _____ |
| 5. Grandparent: | Grandfather Grandmother | Name: _____ |
| 6. Grandchild: | Grandson Granddaughter | Name: _____ |
| 7. Other Relative: | <i>(please describe):</i> _____ | Name: _____ |
| 8. Significant Other/Partner/Fiancé | | Name: _____ |
| 9. Friend: | | Name: _____ |
| 10. Other: | <i>(please describe):</i> _____ | Name: _____ |

Please circle the answer which best describes how you feel right now.

1. I think about this person so much that it's hard for me to do the things I normally do...

0	1	2	3	4
never	rarely	sometimes	often	always

2. Memories of the person who died upset me...

0	1	2	3	4
never	rarely	sometimes	often	always

3. I feel I cannot accept the death of the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

4. I feel myself longing for the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

5. I feel drawn to places and things associated with the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

6. I can't help feeling angry about his/her death...

0	1	2	3	4
never	rarely	sometimes	often	always

7. I feel disbelief over what happened...

0	1	2	3	4
never	rarely	sometimes	often	always

8. I feel stunned or dazed over what happened...

0	1	2	3	4
never	rarely	sometimes	often	always

9. Ever since he/she died it is hard for me to trust people...

0	1	2	3	4
never	rarely	sometimes	often	always

10. Ever since he/she died I feel like I have lost the ability to care about other people or I feel distant from people I care about...

0	1	2	3	4
never	rarely	sometimes	often	always

11. I have pain in the same area of my body or have some of the same symptoms as the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

12. I go out of my way to avoid reminders of the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

13. I feel that life is empty without the person who died...

0	1	2	3	4
never	rarely	sometimes	often	always

14. I hear the voice of the person who died speak to me...

0	1	2	3	4
never	rarely	sometimes	often	always

15. I see the person who died stand before me...

0	1	2	3	4
never	rarely	sometimes	often	always

16. I feel that it is unfair that I should live when this person died...

0	1	2	3	4
never	rarely	sometimes	often	always

17. I feel bitter over this person's death...

0	1	2	3	4
never	rarely	sometimes	often	always

18. I feel envious of others who have not lost someone close...

0	1	2	3	4
never	rarely	sometimes	often	always

19. I feel lonely a great deal of the time ever since he/she died...

0	1	2	3	4
never	rarely	sometimes	often	always

Table 1. Diagnostic Criteria for Complicated Grief

Criterion A

Person has experienced the death of a significant other and response involves 3 of the 4 following symptoms experienced at least daily or to a marked degree:

1. Intrusive thoughts about deceased
2. Yearning for deceased
3. Searching for deceased
4. Excessive loneliness since the death

Criterion B

In response to the death, 6 of the following 11 symptoms experienced at least daily or to a marked degree:

1. Purposelessness, feelings of futility about future
2. Subjective sense of numbness, detachment, or absence of emotional responsiveness
3. Difficulty acknowledging the death (disbelief)
4. Feeling life is empty or meaningless
5. Feeling that part of oneself has died
6. Shattered world view (lost sense of security, trust, control)
7. Assumes symptoms or harmful behaviors of, or related to, the deceased
8. Excessive irritability, bitterness, or anger related to the death
9. Avoidance of reminders of the loss
10. Stunned, shocked, dazed by the loss
11. Life is not fulfilling without the deceased

Criterion C

Duration of disturbance (symptoms listed) is at least six months

Criterion D

The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

APPENDIX B: The Structured Clinical Interview for Traumatic Grief (SCI-TG)

Form 1. The SCI-TG

STRUCTURED CLINICAL INTERVIEW OF TRAUMATIC GRIEF

SCI-TG	
ID: _____	Rater Initials: _____
Date: ____/____/____	Rater Number: _____

Interviewers please note: For post-treatment interviews, please skip to Question #2.

	NO	MAYBE	YES
<u>PART I: CHARACTERISTICS OF THE DEATH</u>			
1a. Have you experienced the death of someone close to you?	0	1	2
1b. If yes, did you feel numbness or disbelief when it happened, or when you heard about it? Did you feel a sense of unreality or horror? Did you feel any other overwhelming emotion?	0	1	2
Describe: _____			

1c. Was the death more than 6 months ago?	0	1	2
---	---	---	---

*Interviewers please note: The following questions refer to a **PAST MONTH** timeframe.*

<u>PART II: CURRENT GRIEF INTENSITY</u>			
2a. Have you had trouble accepting the death?			
Notes: _____	0	1	2

2b. Have you had intense yearning, longing, or searching for the person who died?			
Notes: _____	0	1	2

2c. Do you feel bitter or angry about the death?	0	1	2
Notes: _____			

- | | | | | |
|-----|--|---|---|---|
| 2d. | Do you have frequent intense pangs of grief?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 2e. | Do you feel that grief is all that you have left of the deceased?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 2f. | Does it seem to you that it would be a betrayal of the deceased if you were to stop grieving?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 2g. | Do other people avoid talking about him/her because they are afraid you will get very upset?
<i>Notes:</i> _____ | 0 | 1 | 2 |

PART III: COGNITIVE SYMPTOMS

- | | | | | |
|-----|---|---|---|---|
| 3a. | Have you had recurrent intrusive thoughts or images of the deceased?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 3b. | Do you keep seeing _____ as he/she was just before he/she died?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 3c. | Do you see him or her in some other way that really bothers you?
<i>Notes:</i> _____ | 0 | 1 | 2 |
| | | | | |
| 3d. | Have you had guilty or self-blaming thoughts or beliefs about the death?
<i>Notes:</i> _____ | 0 | 1 | 2 |

<hr/>				
3e.	Do you blame yourself for doing, or not doing something either when _____ was alive, or at the time he/she died, that you think might have helped?	0	1	2
	Notes: _____			

		NO	MAYBE	YES
3f.	Do you have the idea that you could have prevented this death, even though you know it isn't very rational?			
	Notes: _____			

<u>PART IV: INADEQUACY/DEPRESSIVE SYMPTOMS</u>		0	1	2
4a.	Do you feel like your life has no purpose without _____?			
	Notes: _____	0	1	2

4b.	Do you think you can't experience joy or satisfaction without him/her?	0	1	2
	Notes: _____			

4c.	Do you find it difficult to care about other people or are you having trouble feeling close to family or friends-even feeling distant and/or cut-off from them? Do you have a feeling of alienation?	0	1	2
	Notes: _____			

4d.	Do you have the feeling that you are at the end of your rope-that if something else bad were to happen you wouldn't be able to cope?	0	1	2
	Notes: _____			

4e.	Do you feel that since _____ died, even small problems are difficult to deal with?	0	1	2
	Notes: _____			

PART V: PREOCCUPATION

- | | NO | MAYBE | YES |
|---|----|-------|-----|
| 5a. Have you had periods of time when you found yourself in a state of reverie about _____? | | | |
| Notes: _____ | 0 | 1 | 2 |

- | | | | |
|--|---------|------------|----------|
| 5b. Are there things (e.g. visit the cemetery/spend time with ashes, reminisce about him/her, looking at pics, scrapbooks, etc) that you feel a strong urge or a pressure to do, to remind or comfort yourself-things that if you didn't do them you would feel badly? | NO
0 | MAYBE
1 | YES
2 |
| Notes: _____ | | | |

- | | | | |
|---|---|---|---|
| 5c. Are there items that belonged to _____ that have special meaning to you that you feel the need to see, touch, or spend time with? | 0 | 1 | 2 |
| Notes: _____ | | | |

PART VI: AVOIDANCE

- | | | | |
|--|---|---|---|
| 6a.. Do you avoid activities, people, places, or objects that remind you of _____? | 0 | 1 | 2 |
| Notes: _____ | | | |

- | | | | |
|--|---|---|---|
| 6b. Do you avoid going to the cemetery, going out to places you went together? Do you avoid the place where the person died, or place where he/she was hurt or became ill or any other place related to the death? | 0 | 1 | 2 |
| Notes: _____ | | | |

- | | | | |
|--|--|--|--|
| 6c. Do you feel reluctant to talk about _____? | | | |
| Notes: _____ | | | |

- 6d. Do you avoid getting rid of possessions because it would make you too sad or because having his/her things is a way of comforting yourself?

Notes: _____

0

1

2

NO

MAYBE

YES

PART VII: OVERALL

7. Overall, is grief the most important problem you have right now?

Notes: _____

0

1

2

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